



Hanford Advisory Board September 7, 2006

***Roy J. Schepens, Manager
Office of River Protection***



Office of River Protection



CH2MHILL
Hanford Group, Inc.



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**Washington Group
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***U.S. Department of Energy
Office of River Protection***





What we Heard from the Hanford Advisory Board in Fiscal Year 2006

- ❑ 14 pieces of advice since September 2006
- ❑ 10 of those 14 had an impact on the Office of River Protection
 - State of the Site Meetings (#191)
 - Tank Waste Systems Integration (#189)
 - Contracting Strategy (#188)
 - FY 2008 and FY 2007 Budget (#187 & #186)
 - Tank Closure & Waste Management Environmental Impact Statement (#185)
 - Tank closure & Waste Management Environmental Impact State Scoping Process (#184)
 - Bulk Vitrification (#183)
 - Contract Management and Upcoming Major Contracts (#182)
 - Waste Treatment Plant (#178)



How Advice Impacted Office of River Protection

- ❑ Several pieces of advice support our current path forward:
 - Tank Waste Systems Integration affirms the approach we discussed with the Tank Waste Committee regarding a holistic or systems review which links tank farm operations and closure with potential supplemental treatment and planned operations of the WTP.
 - The Tank Closure & Waste Management Environmental Impact Statement advice was useful in describing similar expectations that the DOE and Washington State Department of Ecology share related to transparency and quality assurance.
 - In the Contract Management and Upcoming Major Contracts advice you stated concerns with training of contract and technical support staff. ORP has strengthened staff requirements and training by management and staff attending leadership and project management training.



Focus for Fiscal Year 2007

- ❑ **Public Policy Values** – Provide an open and thorough airing from the HAB on issues involving public policy values where there is potentially conflicting advice to DOE and there is not a clear right or wrong answer.
- ❑ **Prioritization of Cleanup Work** – Sequencing of work based on public values and principles (not from a funding perspective) is the sequencing of cleanup work over the next 5, 10 or 15 years right? What criteria or guidelines are important factors we should consider in determining trade-off decisions of acceleration and/or re-sequencing of work activities?
- ❑ **Institutional Controls** – Provide the Tri-Party Agencies methods and recommendations to achieve public confidence on the effectiveness and longevity of institutional controls in the Central Plateau.
- ❑ **End States** – Provide the Tri-Party Agencies methods and recommendations to achieve public confidence on the effectiveness and vision of cleanup End States.
- ❑ **Tank Closure** – What does closure of a tank farm look like?
- ❑ **Groundwater Integration** – The Groundwater Management Plan will be revised in 2007 to better integrate groundwater and vadose zone remedy decision making. Provide us with advice on remediation priorities and methods to improve integration across the Central Plateau and the Tank Farms.
- ❑ **Public Involvement** – Advise the Tri-Party Agencies in evaluating and optimizing public involvement outreach efforts to attract increased public participation. Provide guidance on products and methods the agencies should create to help educate the public as well as guidance of how to evaluate the effectiveness of these products and/or methods.
- ❑ **Tank Closure and Waste Management Environmental Impact Statement (EIS)** – Continue frequent consultation with the Tri-Party Agencies on the status of the EIS. Provide advice as necessary that will help us develop a credible and defensible EIS through an open and transparent process.



Safety is Office of River Protection's (ORP) Highest Priority

- ❑ Immediate Safety Risk Reduction
 - Interim Stabilized Tanks
 - Accelerated Tank Retrievals
- ❑ Vitrifying All Tank Waste
- ❑ Conservative Approach to Tank Vapors Issue
 - Tank Farm Workers Required to Use Supplied Air to Protect from Tank Vapors Until Hazard is Completely Characterized and Proved Safe
- ❑ Conservative Facility Design - Design Requires Defense in Depth
 - Elimination of Hazards Preferred
 - Engineered Safety Feature Preferred if Hazards cannot be Eliminated
 - Administrative Controls
 - Personnel Protective Equipment
- ❑ Highly Skilled, Trained and Experienced ORP and Contractor Staff
- ❑ Safety is Effectively Integrated into All Programs and Process through Integrated Safety Management





Office of Counterintelligence
Richland Regional Office
Mark Hanneman, SCIO

Office of River Protection
Roy J. Schepens, Manager (MGR) (S)
Cathy Poynor, Secretary
Shirley J. Olinger, Deputy Manager (DEP) (S)
Vacant, Program Assistant

C. Fetto, HR/DNFSB Liaison
E. Olds, Media Specialist
S. Stubblebine, Attorney
Vacant – Attorney-Advisor (Contract)

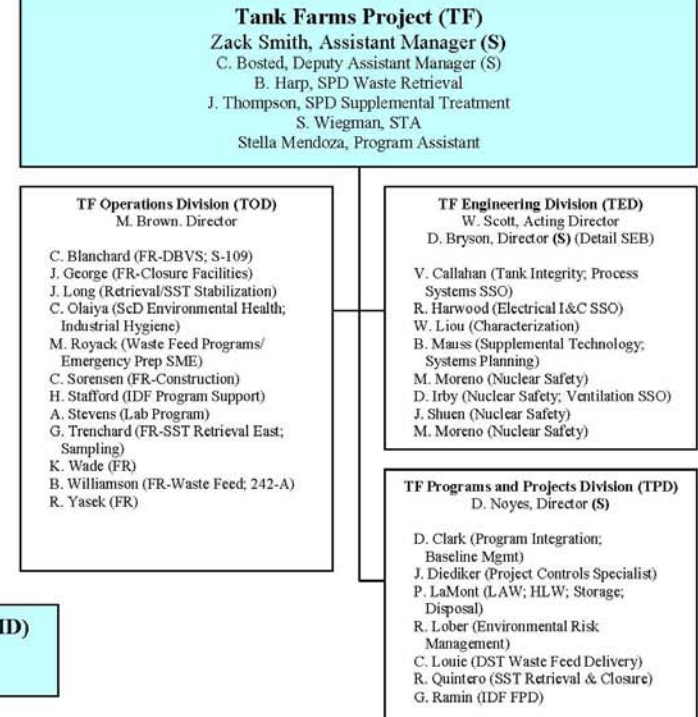
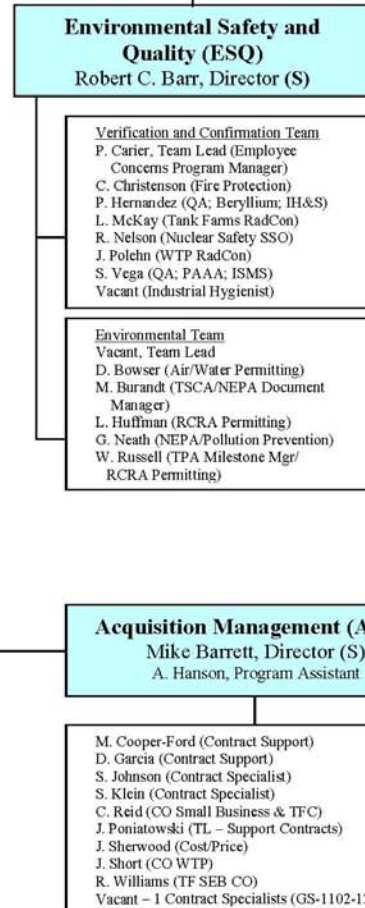
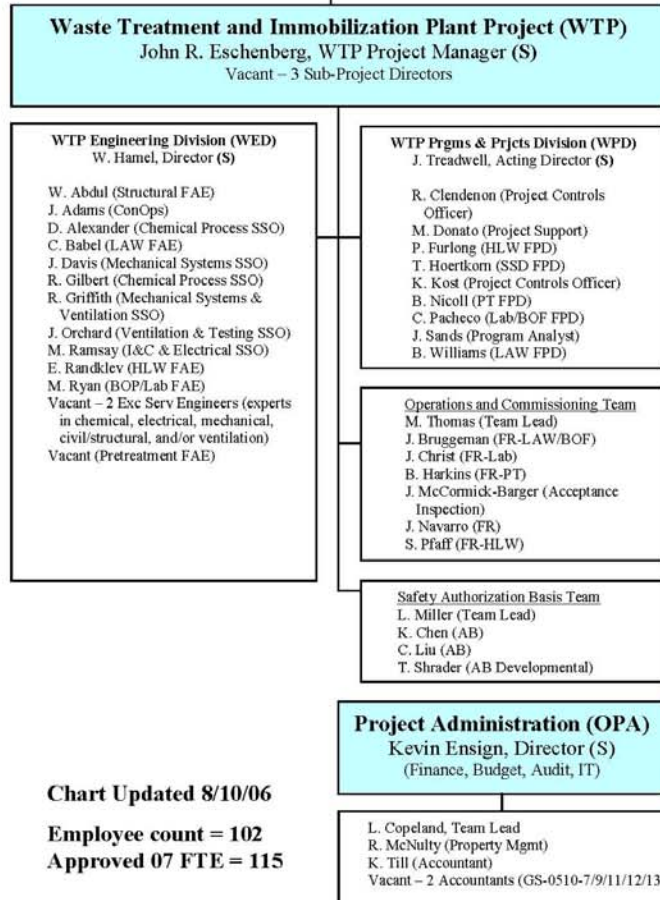


Chart Updated 8/10/06

Employee count = 102

Approved 07 FTE = 115

Roy J. Schepens

Roy J. Schepens, Manager



Senior Management Integration Team (SMIT)

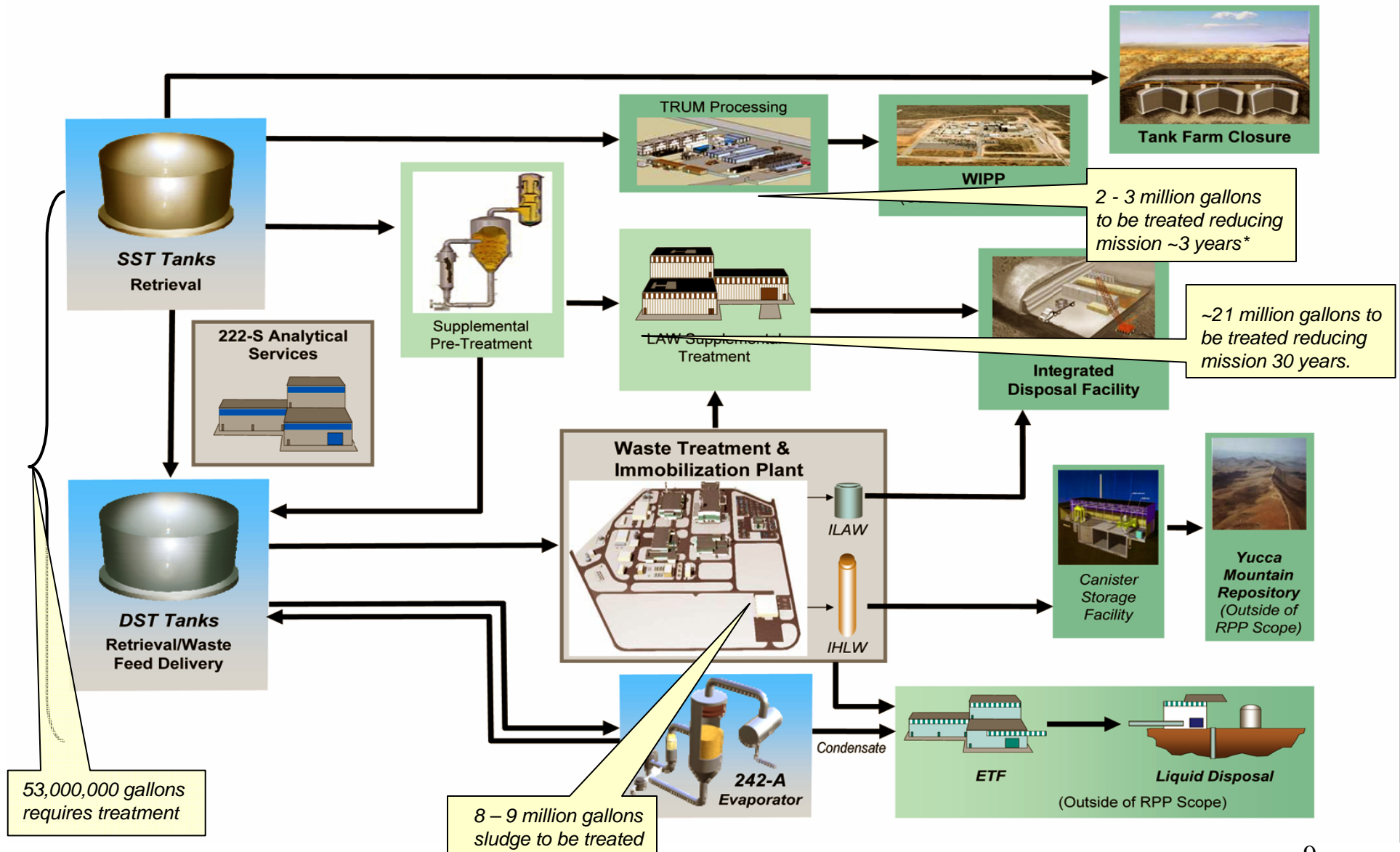
- ❑ Established in April 2006 to provide executive oversight and direction to integrate and optimize activities carried out by the TF Contractor and WTP Contractors and U.S. Department of Energy (DOE).
- ❑ Includes senior managers from ORP, WTP Contract, and the TF Contract.
- ❑ Meets on average twice a month to:
 - Ensure WTP Contractor and TF Contractor alignment,
 - Keep senior managements' interface perspectives and insights current,
 - Commission analyses, white papers, and other activities to enhance performance,
 - Identify technical and programmatic risks and risk management approaches,
 - Approve System Plan assumptions, key parameters, and scenarios and alternatives,
 - Advise EM of pending plans, issues, and performance enhancement opportunities,
 - Provide focused direction to River Protection Program (RPP) participants.



SMIT Agenda Items To Date

- ❑ Systems Plan/Hanford Tank Waste Operations Simulator (HTWOS) Runs (4/14/06)
- ❑ RPP Baseline Schedule Status/Issues (4/21/06)
- ❑ RPP Baseline Cost Assumptions/Status (4/21/06)
- ❑ Interface Control Documents (ICDs) Status/Issues (4/28/06)
- ❑ High Level Waste (HLW) Glass Development (waste loading improvements) (5/5/06)
- ❑ HTWOS Sensitivity Case Analysis Status (5/5/06)
- ❑ TF Tri-Party Agreement (TPA) Discussion Objectives (5/26/06)
- ❑ WTP TPA Discussion Objectives (5/26/06)
- ❑ Integration of TF & WTP Strategies (5/26/06)
- ❑ Single-Shell Tank Performance Assessment (6/23/06)
- ❑ RPP Risk Management Approach (6/23/06)
- ❑ Technology Status Update (6/23/06)
- ❑ Status & Strategy for TPA Discussions (7/7/06)
- ❑ Start Low Activity Waste First (7/21/06)
- ❑ HTWOS Baseline Case Results and Sensitivity Case Assumptions (7/21/06)
- ❑ HLW Melter Bubbler Location Optimization (8/4/06)
- ❑ Savannah River Site and ORP Glass Waste Loading Assumptions/Calculation Approaches (8/4/06)
- ❑ Caustic Recycle Using Electrochemical Ceramic Membranes (8/4/06)
- ❑ ICD Issues Requiring ORP Resolution (8/4/06)

River Protection Project Mission



*A decision for disposal at the Waste Isolation Pilot Plant (WIPP) will not be made until (1) the waste meets the WIPP Waste Acceptance Criteria, with special emphasis on the waste determination as delineated in the WIPP recertification decision by the Environmental Protection Agency in March 2006; and (2) it meets the regulatory eligibility requirements for disposal as described in the WIPP Hazardous Waste Facility Permit.



Status of the River Protection Mission



Waste Treatment Plant Construction

- ❑ Construction 30% complete
- ❑ Design 70% complete



Tank Retrieval and Closure Activities

- ❑ Tanks retrieved to date: C-106, C-203, C-202 and C-201.
- ❑ Tanks in retrieval: S-112; S-102, C-103, and C-204
- ❑ Tank C-108 being outfitted for retrieval
- ❑ New retrieval technologies are working



Design and Testing of Supplemental Low-Activity Waste Treatment

- ❑ 58 lab-scale & engineering-scale tests completed including one each with actual waste and 7 large-scale runs with simulants
- ❑ Facility design 100% complete
- ❑ Integrated dryer/large-scale test in Fiscal Year 2007



Integrated Disposal Facility

- ❑ Construction completed

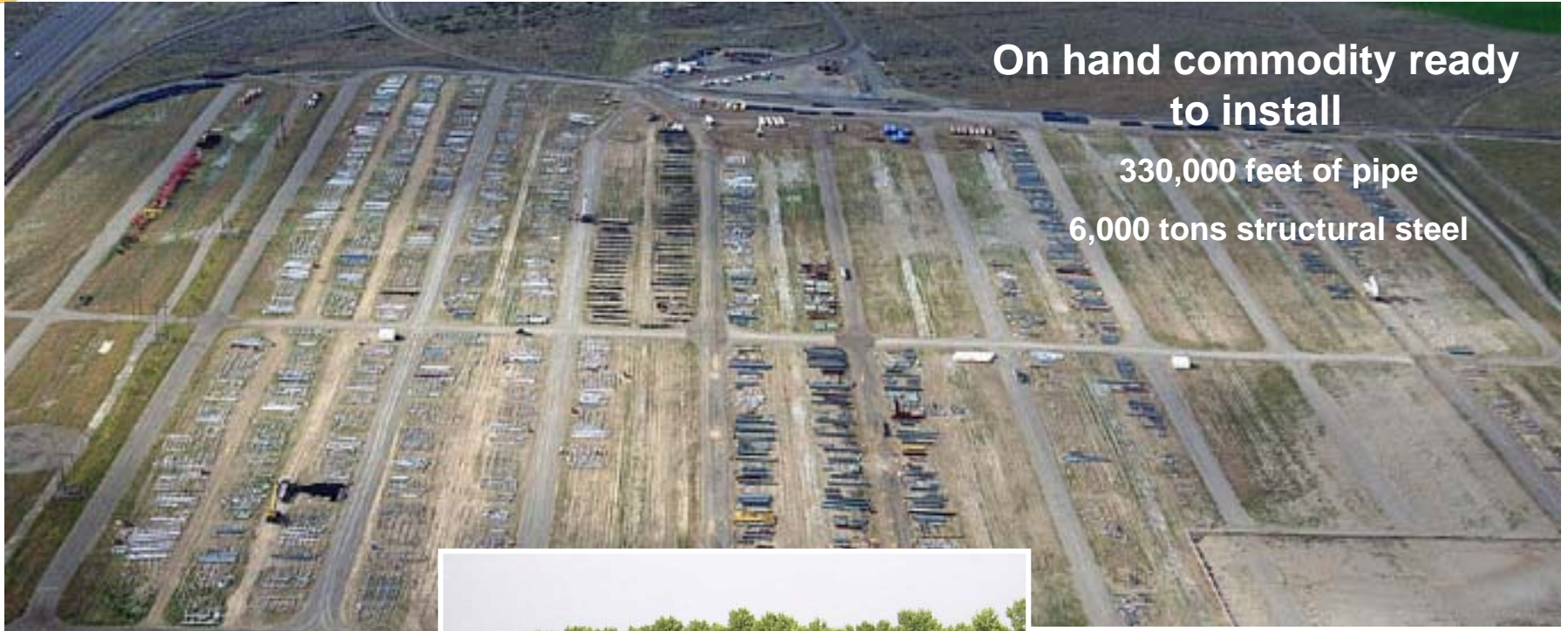


Low-Activity Waste Facility





Marshalling Yard



**On hand commodity ready
to install**

330,000 feet of pipe

6,000 tons structural steel





Waste Treatment Plant Work Continues, But Challenges Remain

- ❑ What Has Worked:
 - Right-sized plant – more capable – that can complete the mission
 - Building a well qualified and experienced staff
- ❑ What could have been done better:
 - Earlier use of industry experts
 - Engineering and construction too closely coupled
 - Very large projects contingency calculation methodology underestimated impacts of Programmatic risks, world economics, under-appreciation of escalation/inflation rates, and technical risks
- ❑ What's Next:
 - Establish credible Project cost and schedule baseline
 - Addressing recommendations from industry experts
 - U.S. Army Corps of Engineers completing validation of review of the May 2006 Project Estimate at Completion (EAC)
 - Plan to have new project baseline by late summer 2006
 - Develop an Interim Project Baseline
 - Certify the contractor's Earned Value Management System in November 2006



Restoring Confidence and Credibility

- ❑ Secretary's Direction
- ❑ Bottom's up EAC
- ❑ More rigorous reporting
- ❑ Comprehensive validation review
- ❑ EM Office of Project Recovery established
- ❑ After Action Fact Finding Review
- ❑ Industry Expert Reviews



Hanford Tank Cleanup Status

Office of River Protection

Retrieval Summary Updated through August 4, 2006

RETRIEVED

C-201

- Capacity of tank: 55,000 gallons
- Completion date: March 23, 2006
- Volume removed: 717 gallons
- Curies removed: 961
- Technology used: Vacuum retrieval

C-202

- Capacity of tank: 55,000 gallons
- Completion date: August 11, 2005
- Volume removed: 1,163 gallons
- Curies removed: 2,560
- Technology used: Vacuum retrieval
- Lessons learned from first application reduced retrieval time from nine months to just six weeks.

C-203

- Capacity of tank: 55,000 gallons
- Completion date: March 24, 2005
- Volume removed: 2,441 gallons
- Curies removed: 1,095
- Technology used: Vacuum Retrieval
- First application of this innovative retrieval technology

C-106

- Capacity of tank: 530,000 gallons
- Completion date: December 31, 2003
- Volume removed: 194,229 gallons
- Curies removed: 8,885,700
- Technology used: Sluicing/Acid dissolution
- C-106 was a high heat tank and was placed on a safety "watch list". Retrieval of the waste solved this safety issue.

IN PROGRESS

C-204

- Capacity of tank: 55,000 gallons
- Retrieval started: July 23, 2006
- Volume of waste to be removed: 1,486 gallons
- Volume of waste removed to date: 202 gallons
- Curies removed to date: 66 of 486
- Technology in use: Vacuum retrieval

C-103

- Capacity of tank: 530,000 gallons
- Retrieval started: November 6, 2005
- Volume of waste to be removed: 72,000 gallons
- Volume of waste removed to date: 68,294 gallons
- Curies removed to date: 2,675,901 of 2,700,091
- Technology in use: Modified sluicing

S-102

- Capacity of tank: 758,000 gallons
- Retrieval started: December 17, 2004
- Volume of waste to be removed: 464,000 gallons
- Volume removed to date: 253,000 gallons
- Curies removed to date: 335,199 of 704,283
- Technology in use: Saltcake Dissolution
- Engineers developed unique variable height pump to prevent clogging that occurred using conventional pump assembly.

S-112

- Capacity of tank: 758,000 gallons
- Retrieval started: September 28, 2003
- Volume of waste to be removed: 614,000 gallons
- Volume removed to date: 609,543 gallons
- Curies removed to date: 590,105 of 628,068
- Technology in use: Remote Water Lance/Modified Sluicing
- Demonstration project under way to determine effectiveness of remote water lance to break up and mobilize hardened waste at bottom of tank.

NEXT IN LINE

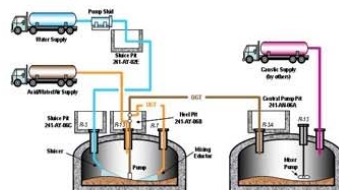
C-108

- Capacity of tank: 530,000 gallons
- Volume of waste to be removed: 66,000 gallons
- Curies to be removed: 167,198
- When retrieval to begin: FY 2007
- Technology to be used: Modified sluicing

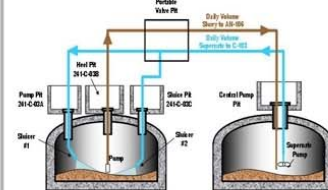
S-109

- Capacity of tank: 758,000 gallons
- Volume of waste to be removed: 400,000 gallons
- Curies to be removed: 35,214*
- When retrieval to begin: 2010
- Technology to be used: Selective Saltcake Dissolution
- Up to 200,000 gallons are to be used in the Demonstration Bulk Vitrification System to demonstrate a new technology with potential to supplement the Hanford Vitrification Plant for treatment of low activity waste.
- *The 35,214 number of curies is based on assumption that 80% of the Cs-137 and Tc-99 will be retrieved.

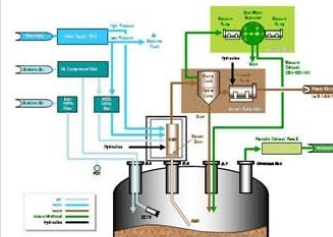
Acid Dissolution



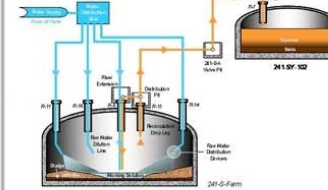
Modified Sluicing



Vacuum Retrieval



Saltcake Dissolution



Remote Water Lance (Salt Mantis)

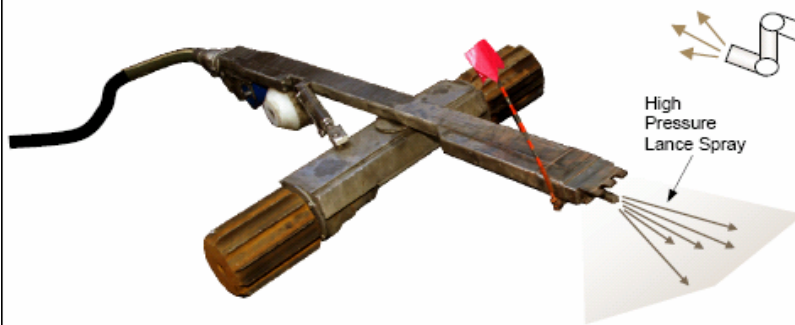




New Innovative Tank Waste Retrieval Technologies

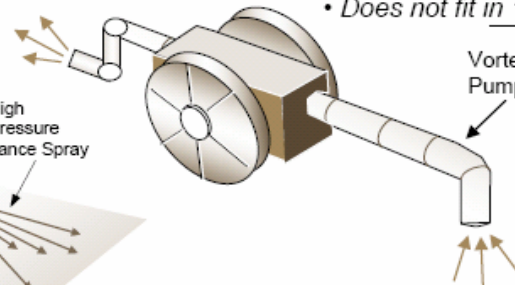
Salt Mantis: Waste Breakup and Mixing Tool

- High pressure spray breaks up and mixes waste
- Augments other retrieval systems



Aardvark: Waste Breakup and Transfer Tool

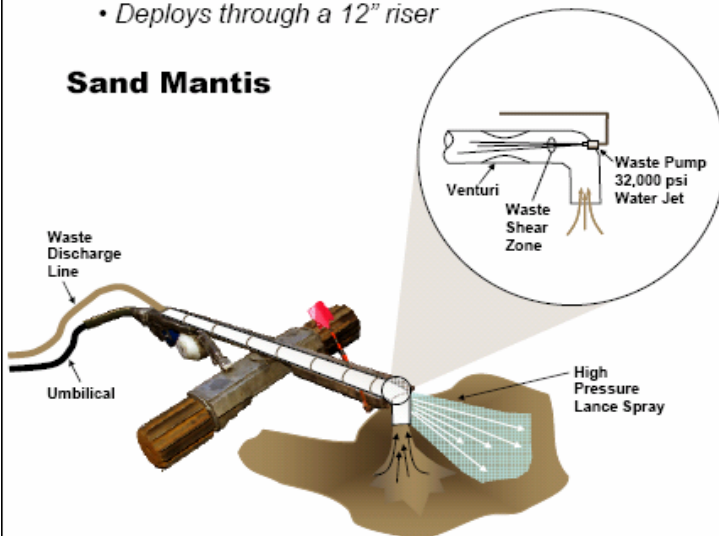
- Developed for mining industry
- Pumps material with Vortex Pump
- Does not fit in 12" riser



Sand Mantis: Waste Breakup, Mixing, and Transfer Tool

- Waste transfer capability added to "Salt Mantis"
- Deploys through a 12" riser

Sand Mantis



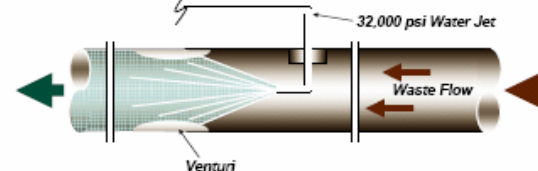
Rotary Viper: Waste Mixing Tool

- Sluicer
- Mixes Waste
- Fits down 4" Riser



Squid Pump: In-Line Waste Transfer Tool

- Small size allows installation of Transfer Lines and in existing pits





Bulk Vitrification (BV) Technology Demonstration Program



- ❑ Results to date indicate that BV glass comparable to WTP ILAW
- ❑ Allows treatment flexibility in treating difficult waste streams
- ❑ Secondary waste is minimized and recycled within the process or sent to Effluent Treatment Facility (no orphan waste streams)
- ❑ Results from BV testing have application to WTP operations (i.e. off-gas system technology/performance and waste form qualification)
- ❑ Independent Expert Review Panel Demonstration Bulk Vitrification System review underway – no fatal flaws at mid-way debrief
- ❑ May allow interim LAW treatment prior to WTP startup



Hanford Discussion Meetings

- ❑ In June and July two meetings were held involving senior management from the Tri-Party Agencies along with a representative from DOE Headquarters Office of Environmental Management.
- ❑ The purpose was to launch a collaborative process to understand cleanup challenges and their relationship to TPA commitments.
- ❑ The Agencies have begun to chart a process whereby we can mutually understand and agree on the scope of the challenges and develop key assumptions, logic ties, and end states related to the schedule and cost for key cleanup activities.
- ❑ The Tri-Party Agencies are hopeful that unnecessary, costly, and time-consuming litigation can be avoided through constructive dialogue and mutual agreement.



ORP Work Scope for Fiscal Year 2007

- ☐ Construction continues on the Low-Activity Waste Facility, the Analytical Laboratory and the Balance of Facilities.
- ☐ The High-Level Waste and Pretreatment Facilities construction will be deferred until 2008.
- ☐ Continued retrieval of Single-Shell Tanks.
- ☐ Bulk Vitrification will do 130 liter scale dry tests to be completed by the end of October 2006. External Independent Review to review baseline in support of Critical Decision (CD) 2.



Conclusions

- ❑ Safety is our top priority – Our workers are our greatest asset
- ❑ The Waste Treatment Plant is the cornerstone of Hanford Tank Waste cleanup
- ❑ Supplemental Technologies are yielding promising results
- ❑ New innovative tank waste retrieval technologies are working
- ❑ Continued focus on Priorities
- ❑ Participation of regulators, stakeholders and tribal nations is key to our success